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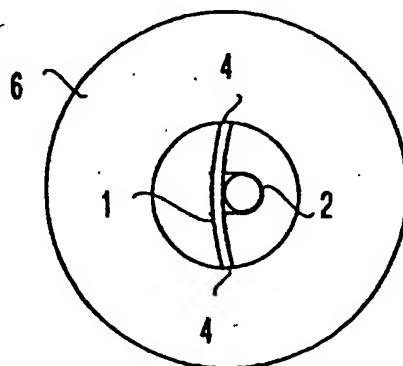
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(54) Title: MOUNTING DEVICE FOR AN ESCORT MEMORY

(57) Abstract

The present invention relates to a mounting device for fastening an escort memory (2) to an essentially tubular object (6), such as the core of a paper reel, which mounting device (1) is made of essentially flexible material and comprises means for fastening the escort memory to the device. For achieving a well protected installation and firm fastening, the flexible mounting device (1) can be compressed or bent sufficiently to be entirely fitted into the tubular object (6). The compressed or bent mounting device (1) fitted into the tubular object behaves in a spring-like manner, tending to return to its original shape, whereby the mounting device presses against the inner surface of the tubular object (6) so as to fasten the mounting device to the tubular object.



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## Mounting device for an escort memory

5        The present invention relates to a mounting device for fastening an escort memory to an essentially tubular object, such as the core of a paper reel, which mounting device is made of essentially flexible material and comprises means for fastening the escort memory to the device.

10       In this application, an escort memory refers to a unit which preferably comprises a transmitter, a receiver and a memory circuit, the data contained therein being machine readable by means of a signal sent by the transmitter. The data contained in the escort memory can be read through all non-metallic objects. A typical 15       reading distance varies between 5 and 50 cm depending on the antenna used. The components of the escort memory can be encapsulated in many different ways, for example by packing them into an epoxy disc or capsule. An escort memory capsule of this kind is typically 10 to 20 mm 20       long and 2 to 3 mm thick.

25       The escort memory can be used for storing pre-determined data, for example data needed for identifying a paper reel. When the escort memory is brought to the vicinity of a reading device, the receiver of the escort memory detects the low-frequency (inductive or microwave) identification request signal sent by the read head. The escort memory responds to this signal by inductively transmitting the identification data stored in the memory circuit to the read head. Escort memories 30       are previously known, and their operation has been described for example in Finnish Patent 85,079, and therefore their operation is not described in more detail in this connection.

35       A prior art mounting device for fastening an escort memory is a circular cardboard disc, by means of

which the escort memory is fastened to the end of a paper reel. In said solution the escort memory is fastened to the mounting device for example by glueing. The cardboard disc has a cut-off flap, for example rectangular in shape, with the same width as the inner diameter of the paper reel core. In this connection, the core means the hollow, tubular reel around which paper is wound in the paper mill.

When the above mentioned prior art mounting device is fastened to the paper reel core, said flap is folded 90° down from the level of the cardboard disc and thereby forms a projection to be inserted into the core. As the width of the projection is the same as the inner diameter of the paper reel core, the projection contacts the inner surface of the core when the cardboard disc is installed to the end of the core. Said contact, or primarily the wedging force of the projection, causes the cardboard disc and the escort memory attached to it to stick to the end of the paper reel.

The major disadvantage of the above mentioned prior art mounting device is the fact that herein the escort memory is installed to the end of a paper reel core, or practically level with the end surface of the paper reel. This is a most disadvantageous place for installing the escort memory, because paper reels sometimes receive severe impacts during handling, which causes a risk of damage to the escort memory containing sensitive electronic components. Another significant disadvantage of this prior art solution is the fact that the inner diameter of paper reel cores is not standardized, but cores of different sizes and widely varying diameters (100 to 200 mm) are being used. The situation being this, there has to be a separate escort memory mounting device for each core size. A third significant disadvantage in connection with this prior art solution

is the poor fastening between the mounting device and the core. That is to say, the fastening of the escort memory mounting device to the paper reel is dependent on the wedging force of the mounting device against the inner surface of the core. The shape of this prior art mounting device is very disadvantageous in view of the wedging force. In practice, the fastening cannot be improved by increasing the width of the projection, because then there is a danger that the projection or flap would break at the fold upon insertion into the paper reel core, which would further weaken the fastening between the projection and the core.

The object of the present invention is to solve the above mentioned problems and to provide an escort memory mounting device which is not dependent on the inner diameter of the paper reel core and by means of which the escort memory can be fastened simply and firmly to a place where it is not damaged. These objects are achieved with a mounting device according to the invention, which is characterized in that the flexible mounting device can be compressed or bent sufficiently, enabling the device to be entirely fitted into the tubular object, and that the compressed or bent mounting device fitted into the tubular object behaves in a spring-like manner, tending to return to its original shape, whereby the mounting device presses against the inner surface of the tubular object so as to fasten the mounting device to the tubular object.

The invention is based on the idea that the mounting device is far better attached to the paper reel core when the mounting device is made of flexible or elastic material and shaped in such a way that it can be compressed or bent in a spring-like manner and entirely fitted into the paper reel core, and fastened to it by means of forces caused by the spring-like beha-

viour of the mounting device. Hereby both the mounting device and the escort memory fastened to it are very well protected against external impacts.

Thus the major advantage of the mounting device according to the invention is the fact that the mounting device and the escort memory fastened to it are very well protected against external impacts when disposed within the paper reel core. Another advantage achieved with the mounting device according to the invention is the fact that a mounting device of one size can be used for cores with different inner diameters. This is due to the fact that the mounting device can be compressed or bent, whereby the variations in the inner diameters of the cores can be compensated for by adjusting compression or bending.

In one preferred embodiment, the mounting device according to the invention is rectangular in shape and thus its width and length are different. The rectangular shape enables installation of the mounting device within the paper reel core in two alternative directions, i.e. the mounting device can be bent or compressed in the direction of either its width or its length. This preferred embodiment according to the invention provides the advantage that the same mounting device can be used for cores which have substantially different inner diameters.

In another preferred embodiment, the mounting device according to the invention comprises a weakening area or line, at which the mounting device can be easily broken. Thus the mounting device can be easily adapted to a suitable size if it is to be fastened to a core with such a small diameter that the mounting device cannot be directly compressed or bent sufficiently for installing it in place.

Preferred embodiments of the mounting device according to the invention are disclosed in the attached dependent claims 2 to 6.

5 In the following the invention will be described in more detail by means of a few preferred embodiments with reference to the accompanying Figures, in which

10 Figure 1 shows a first preferred embodiment of the mounting device according to the invention,

Figure 2 shows a mounting device according to Figure 1 as fitted into a paper reel core,

Figure 3 shows a second preferred embodiment of the mounting device according to the invention,

15 Figure 4 shows a third preferred embodiment of the mounting device according to the invention, and

Figure 5 shows a fourth preferred embodiment of the mounting device according to the invention.

20 Figure 1 shows an escort memory mounting device 1 according to the invention. This mounting device is made of some flexible material, such as cardboard or plastic. An escort memory capsule 2 is fastened to the mounting device 1 by means of plastic fasteners 5. The fasteners 5 are attached to the mounting device 1 by means of a snap joint. Naturally, the escort memory capsule 2 can also be fastened to the mounting device 1 by some other means, for example by disposing a flexible plate over the escort memory capsule so that the escort memory capsule 2 is entirely covered by the flexible plate, whereafter said plate is riveted to the mounting device 1, thus causing the escort memory capsule to remain in the pocket between the mounting device 25 and said plate.

30 35 The mounting device shown in Figure 1 is rectangular in shape, and its longitudinal sides 4 and transverse sides 3 are of different length. Thus the

mounting device 1 of Figure 1 can be used in paper reel cores which have widely varying inner diameters. When the core has a very large inner diameter, the mounting device is fitted into it with its longitudinal side first, and when the core has a small inner diameter, the mounting device is fitted into it with its transverse side first.

Figure 2 shows a mounting device 1 according to Figure 1 fitted in place into the paper reel core 6. Figure 2 shows the end of the core from above, and the mounting device 1 fitted into the core. The core shown in Figure 2 has a relatively small inner diameter, and therefore the mounting device 1 has been fitted into it with its transverse side first. Thus the longitudinal sides 4 shown in Figure 1 are directed upwards and downwards in Figure 2 so as to contact the inner surface of the core 6. Figure 2 shows clearly that the mounting device 1 is bent into a curved shape before it is fitted in place. Thus the mounting device 1 and the escort memory 2 attached to it by fasteners remain in place in the core 6 due to the press forces caused by the bending. In the embodiment according to Figure 2, the mounting device 1 is firmly fastened to the core 6, due to the press forces and the relatively long longitudinal sides 4 of the mounting device 1, which are in contact with the inner surface of the paper reel core, and thus there is a considerable friction between the sides of the mounting device and the inner surface of the core.

Figure 3 shows a second preferred embodiment of the mounting device according to the invention, in which the mounting device is a flexible plastic tube 7. Figure 3 shows a longitudinal section of the plastic tube 7. The escort memory capsule 2 is fastened within the plastic tube 7 for example by glueing.

5                   The mounting device 7, i.e. plastic tube, shown in Figure 3, is fastened to the paper reel core in the same way as the mounting device according to Figure 2: it is bent and fitted into the core transversely in relation to the longitudinal axis of the core.

10                  Figure 4 shows a third preferred embodiment of the mounting device according to the invention, in which the mounting device is a compressible rubber bar 9. The mounting device according to Figure 4 is installed in place in the same way as the mounting device according to Figure 3: it is compressed or bent so that it can be fitted into the paper reel core. The fastening of the rubber bar to the paper reel core is improved by mounting spikes 8 disposed at the ends of the bar, which spikes at least partly sink into the inner walls of the core, thus improving the fastening of the mounting device 9. The rubber bar according to Figure 4 can naturally also be used without the mounting spikes.

20                  In Figure 4, the escort memory capsule 2 is fastened to the mounting device 9 by means of a plastic film 10 wrapped around the mounting device 9 and the escort memory capsule 2.

25                  Figure 5 shows a fourth preferred embodiment of the mounting device according to the invention, in which the mounting device is a plastic tube 7 like the one shown in Figure 3. Figure 5 shows a longitudinal section of the plastic tube 7. The escort memory capsule 2 is fitted into the plastic tube 7 and fastened to it by glueing, for example. A weakening groove 11 has been made during manufacturing in the plastic tube shown in Figure 5. Said weakening groove encircles the whole tube, and the plastic tube 7 can be broken at the groove if necessary. Breaking may be necessary if said mounting device 7 must be fitted into a paper reel core which has a small inner diameter, and the mounting device 7 does

not bend sufficiently to be fitted in. The mounting device 7 can then be broken to a suitable length before it is bent and installed in place. The weakening groove 11 on the mounting device is preferably designed so that 5 the mounting device can be broken manually without tools.

The accompanying Figures and the description relating thereto are intended only to illustrate the present invention. The details of the mounting device 10 according to the invention can vary within the scope of the attached claims. Thus it is to be understood that although in the above description the invention has been illustrated mainly by means of an escort memory capsule, the components of the escort memory can naturally also 15 be encapsulated in some other way, such as in a cast epoxy disc. The mounting device according to the invention can naturally also be used for fastening the escort memory to other tubular objects and not only to paper reel cores.

## Claims

1. A mounting device for fastening an escort memory (2) to an essentially tubular object (6), such as the core of a paper reel, which mounting device (1, 7, 9) is made of essentially flexible material and comprises means (5, 10) for fastening the escort memory to the device, characterized in that the flexible mounting device (1, 7, 9) can be compressed or bent sufficiently, enabling the device to be entirely fitted into the tubular object (6), and that the compressed or bent mounting device (1, 7, 9) fitted into the tubular object behaves in a spring-like manner, tending to return to its original shape, whereby the mounting device presses against the inner surface of the tubular object (6) so as to fasten the mounting device to the tubular object.

2. A mounting device according to Claim 1, characterized in that the mounting device (1) is formed as a rectangular plate in which the length of its longitudinal sides (4) differs from the length of its transverse sides (3).

3. A mounting device according to Claim 2, characterized in that the mounting device (1) comprises a weakening line, whereby the external dimensions of the mounting device (1) can be reduced by breaking the mounting device along the weakening line.

4. A mounting device according to Claim 1, characterized in that the mounting device is formed of an elongated tube (7) or bar (9).

5. A mounting device according to Claim 4, characterized in that the mounting device (7) comprises a weakening groove (11), whereby the external dimensions of the mounting device can be reduced by breaking the mounting device at the groove (11).

5        6. A mounting device according to any one of claims 1 to 5, characterized in that the mounting device (1, 7, 9) comprises means (8) which at least partly sink into the inner surface of the tubular object (6) when the mounting device is fastened to it.

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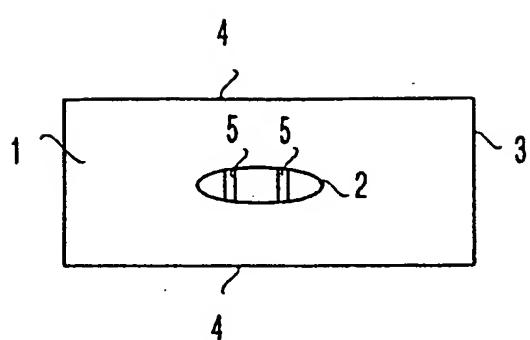


FIG. 1

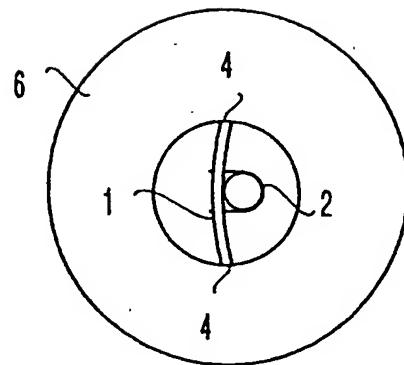


FIG. 2

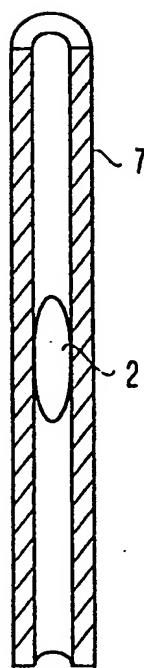


FIG. 3

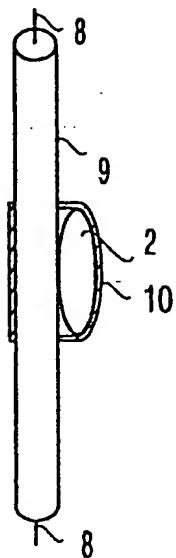


FIG. 4

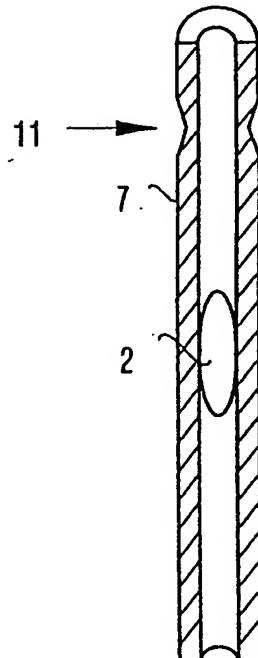


FIG. 5

## INTERNATIONAL SEARCH REPORT

1

International application No.

PCT/FI 94/00201

## A. CLASSIFICATION OF SUBJECT MATTER

IPC5: G09F 3/08, H04B 1/59

According to International Patent Classification (IPC) or to both national classification and IPC

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Minimum documentation searched (classification system followed by classification symbols)

IPC5: G01C, G09F, G11C, H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## CLAIMS, WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4745696 (RAYMOND E. SCOUTEN), 24 May 1988 (24.05.88), figure 2 ---	1
A	US, A, 1738378 (JOHN W. LITTLE), 3 December 1929 (03.12.29), figure 2 ---	1

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4745696	24/05/88	CA-A- 1254740	30/05/89
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